All India Test Series (2023-24)

Test Code: ANY/05 | **AITS TEST - 05** | **Yakeen NEET**

DURATION: 200 Minutes | **DATE: 31/03/2024** | **M. MARKS: 720**

ANSWER KEY

(PHYSICS)

SECTION-A

1.	(4)	8.	(2)	15.	(4)	22.	(3)	29.	(2)
2.	(2)	9.	(4)	16.	(1)	23.	(4)	30.	(3)
3.	(1)	10.	(1)	17.	(1)	24.	(3)	31.	(4)
4.	(2)	11.	(2)	18.	(2)	25.	(3)	32.	(2)
5.	(2)	12.	(3)	19.	(2)	26.	(2)	33.	(1)
6.	(1)	13.	(3)	20.	(3)	27.	(1)	34.	(1)
7.	(4)	14.	(2)	21.	(1)	28.	(4)	35.	(1)

SECTION-B

36.	(2)	39.	(3)	42.	(2)	45.	(1)	48.	(3)
37.	(1)	40.	(2)	43.	(3)	46.	(1)	49.	(2)
38.	(2)	41.	(1)	44.	(2)	47.	(4)	50.	(3)

(CHEMISTRY)

SECTION-A

51.	(4)	58.	(1)	65.	(1)	72.	(4)	79.	(2)
52.	(1)	59.	(1)	66.	(2)	73.	(2)	80.	(2)
53.	(4)	60.	(4)	67.	(3)	74.	(3)	81.	(3)
54.	(2)	61.	(3)	68.	(2)	75.	(1)	82.	(2)
55.	(1)	62.	(2)	69.	(3)	76.	(1)	83.	(2)
56.	(3)	63.	(4)	70.	(4)	77.	(4)	84.	(1)
57.	(3)	64.	(1)	71.	(2)	78.	(2)	85.	(2)

SECTION-B

86.	(4)	89.	(3)	92.	(1)	95.	(1)	98.	(2)
87.	(2)	90.	(4)	93.	(4)	96.	(4)	99.	(1)
88.	(1)	91.	(4)	94.	(2)	97.	(2)	100.	(4)

(BOTANY)

SECTION-A

101.	(3)	108.	(3)	115.	(4)	122.	(3)	129.	(1)
102.	(3)	109.	(3)	116.	(3)	123.	(2)	130.	(3)
103.	(2)	110.	(3)	117.	(1)	124.	(3)	131.	(4)
104.	(4)	111.	(3)	118.	(3)	125.	(2)	132.	(3)
105.	(1)	112.	(4)	119.	(2)	126.	(3)	133.	(2)
106.	(1)	113.	(4)	120.	(3)	127.	(2)	134.	(4)
107.	(3)	114.	(2)	121.	(2)	128.	(4)	135.	(2)

SECTION-B

136.	(2)	139.	(1)	142.	(2)	145.	(3)	148.	(2)
137.	(3)	140.	(3)	143.	(3)	146.	(1)	149.	(1)
138.	(4)	141.	(2)	144.	(1)	147.	(1)	150.	(2)

(ZOOLOGY)

SECTION-A

151.	(4)	158.	(3)	165.	(2)	172.	(3)	179.	(2)
152.	(1)	159.	(1)	166.	(3)	173.	(3)	180.	(3)
153.	(4)	160.	(3)	167.	(2)	174.	(1)	181.	(3)
154.	(2)	161.	(3)	168.	(4)	175.	(3)	182.	(2)
155.	(1)	162.	(4)	169.	(3)	176.	(1)	183.	(4)
156.	(2)	163.	(1)	170.	(4)	177.	(1)	184.	(1)
157.	(1)	164.	(4)	171.	(1)	178.	(3)	185.	(4)

SECTION-B

186.	(3)	189.	(3)	192.	(1)	195.	(3)	198.	(3)
187.	(4)	190.	(3)	193.	(1)	196.	(4)	199.	(1)
188.	(2)	191.	(2)	194.	(4)	197.	(4)	200.	(2)

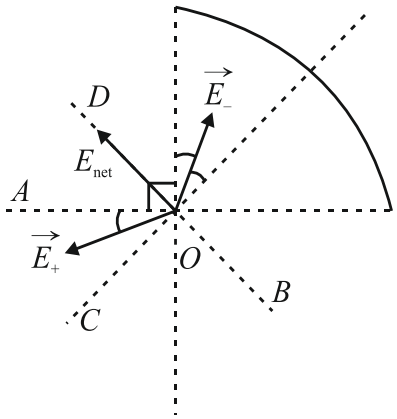
Hints and Solution

(PHYSICS)

SECTION-A

1. (4)

The electric field due to a circular arc is along its bisector.



(NEW NCERT 12th Page No. 14)

2. (2)

$$V = -\frac{GM}{2R}$$

(NEW NCERT 11th Page No. 133)

3. (1)

$$\chi_m \propto \frac{1}{T}$$

(NEW NCERT 12th Page No. 148)

4. (2)

According to Lenz law, the induced current in *A* will be anticlockwise and in *B* will be clockwise.

(NEW NCERT 12th Page No. 160)

5. (2)

On increasing ω capacitive reactance decreases so current in the circuit is increased and hence brightness increases.

(NEW NCERT 12th Page No. 184)

6. (1)

$$E = \frac{KQr}{R^3} \qquad \ldots(1)$$

$$\rho = \frac{Q}{\frac{4}{3}\pi R^3} \qquad \ldots(2)$$

Using (1) and (2)

$$\Rightarrow E = \frac{\rho r}{3\varepsilon_0}$$

(NEW NCERT 12th Page No. 33)

7. (4)

For linear variation

$$I_{avg} = \frac{\text{sum of } I_{\text{extreme}}}{2}$$

$$= \frac{4+10}{2} = 7\text{ A}$$

(NEW NCERT 12th Page No. 81)

8. (2)

While moving across the loop in the given sense of arrows.

$$\oint \vec{B}.\vec{dl} = \mu_0 (i+i) = \mu_0 (2i)$$

(NEW NCERT 12th Page No. 117)

9. (4)

Power factor $\cos\phi = \frac{R}{Z}$

Initially $P_i = \frac{R}{\sqrt{9R^2+R^2}} = \frac{1}{\sqrt{10}}$

Finally $P_f = \frac{R}{\sqrt{5R^2}} = \frac{1}{\sqrt{5}}$

$$\frac{P_f}{P_i} = \sqrt{\frac{10}{5}} = \sqrt{2}$$

(NEW NCERT 12th Page No. 190)

10. (1)

$$q_{flown} = \frac{\Delta\phi}{R}$$

$$\Delta\phi = (q_{flown})R$$

= (Area under *i* vs *t* graph)*R*

$$= \frac{1}{2} \times 0.1 \times 4 \times 10 = 2\text{ Wb}$$

(NEW NCERT 12th Page No. 157)

11. (2)

$F = PA$

$$F = \frac{2I}{C}A = \frac{2 \times 1400 \times 1.5}{3 \times 10^8} = 14 \times 10^{-6}\text{ N}$$

(NEW NCERT 12th Page No. 206)

12. (3)

It is a balanced wheatstone bridge

$$R_{eq} = \frac{60}{2} = 30\Omega$$

$$I = \frac{10}{30} = \frac{1}{3}\text{ A}$$

(NEW NCERT 12th Page No. 100)

13. **(3)**

$$r = \frac{mv}{qB} = \frac{\sqrt{2mK}}{qB}$$

$$\frac{r_1}{r_2} = \sqrt{\frac{m_1}{m_2}}$$

$$\frac{m_1}{m_2} = \left(\frac{r_1}{r_2}\right)^2$$

(NEW NCERT 12th Page No. 112)

14. **(2)**

As both the wires carry equal current in same direction, the magnetic field is zero exactly at the mid point.

(NEW NCERT 12th Page No. 114)

15. **(4)**

Minimum time taken to change from rms to zero is equal to time taken to change from zero to rms.

$$I_{rms} = \frac{I_0}{\sqrt{2}} = I_0 \sin 2\pi nt$$

$$2\pi nt = \frac{\pi}{4}$$

$$t = \frac{1}{8n}$$

(NEW NCERT 12th Page No. 177)

16. **(1)**

$$B_i = \frac{\mu_0 Ir}{2\pi R^2}$$

$$r = \frac{R}{2}$$

$$B_i = \frac{\mu_0 IR}{4\pi R^2} = \frac{\mu_0 I}{4\pi R}$$

$$B_o = \frac{\mu_0 I}{2\pi r}$$

$$r = 2R$$

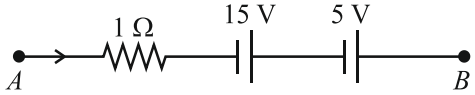
$$B_o = \frac{\mu_0 I}{4\pi R}$$

$$\frac{B_i}{B_o} = 1$$

(NEW NCERT 12th Page No. 119)

17. **(1)**

As here I is decreasing $\left(\frac{dI}{dt}\right)$ is negative, inductor can be replaced by battery of 5 V with the polarity as shown below.



$V_B - V_A = -5 + 15 + 5 = 15$ V

(NEW NCERT 12th Page No. 165)

18. **(2)**

Both A and R are correct but Reason is not correct explanation.

(NEW NCERT 12th Page No. 206)

19. **(2)**

$V_R = IR$

$$V_R = \frac{V}{Z}R$$

$$= \frac{100 \times 10}{\sqrt{(X_L - X_C)^2 + R^2}}$$

$$V_R = \frac{1000}{\sqrt{\left(\omega L - \frac{1}{\omega C}\right)^2 + R^2}}$$

= 100 V

(NEW NCERT 12th Page No. 186)

20. **(3)**

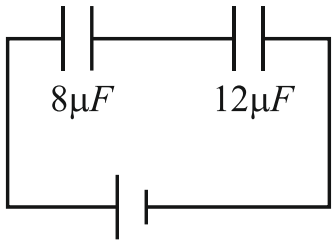
$\tau = pE\sin\theta$

$$p = \frac{\sqrt{3} \times 10^{-24} \times 2}{10^4 \times \sqrt{3}} = 2 \times 10^{-28}\,\text{Cm}$$

(NEW NCERT 12th Page No. 23)

21. **(1)**

The equivalent circuit is



Charge on $8\mu F$, $q = C_{eq}V$

$$C_{eq} = \frac{8 \times 12}{20} = 4.8\ \mu C$$

Charge = $4.8 \times 100 = 480\ \mu C$

(NEW NCERT 12th Page No. 71)

22. **(3)**

Net force on a current loop placed in uniform magnetic field is zero.

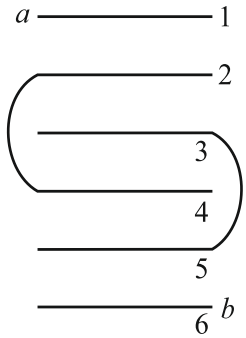
(NEW NCERT 12th Page No. 124)

23. **(4)**

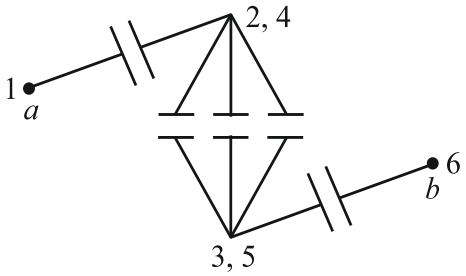
Potential difference in V_4 will be zero as $V_L = V_C$ and both have phase difference of 180°.

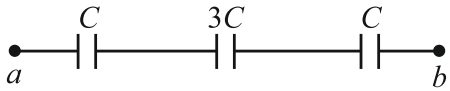
(NEW NCERT 12th Page No. 188)

24. (3)



Potential of plates 2, 4 and 3, 5 are same.
Rearranging the circuit





$$\frac{1}{C_{eq}}=\frac{1}{C}+\frac{1}{C}+\frac{1}{3C}=\frac{7}{3C}$$

$$C_{eq}=\frac{3C}{7}=\frac{3\varepsilon_0 A}{7d}$$

(NEW NCERT 12th Page No. 72)

25. (3)

$$V=\frac{KQ}{R}$$

Conservation of volume

Let new radius is R'

$$\frac{4}{3}\pi R'^3=8\left(\frac{4}{3}\pi R^3\right)$$

$$\Rightarrow R'=2R$$

$$V'=\frac{8KQ}{2R}=\frac{4KQ}{R}=4\text{ V}$$

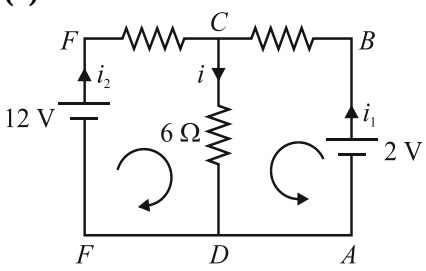
(NEW NCERT 12th Page No. 48)

26. (2)

The acceleration due to gravity is maximum at the surface of Earth.

(NEW NCERT 11th Page No. 132)

27. (1)



$$i=i_1+i_2$$

In loop *ABCDA*

$$+2-i_1(4)-6(i)=0$$

$$1=2i_1+3i \qquad \ldots(1)$$

In loop *EFCDE*

$$12-3i_2-6i=0$$

$$4=2i+i_2 \qquad \ldots(2)$$

Multiply equation (2) with 2 and add in equation (1)

$$8=4i+2i_2$$

$$1=2i_1+3i$$

$$9=2(i_1+i_2)+7i$$

$$9=2i+7i$$

$$i=1\text{ A}$$

(NEW NCERT 12th Page No. 97)

28. (4)

$$|e|=\frac{Nd\phi}{dt}=NA\frac{dB}{dt}=500\times100\times10^{-4}\times1$$

$$|e|=5.0\text{ V}$$

(NEW NCERT 12th Page No. 158)

29. (2)

Magnetic flux over a closed surface is zero.

Magnetic monopoles cannot exist.

(NEW NCERT 12th Page No. 142)

30. (3)

Due to straight wires magnetic field at the center is zero.

Due to semicircle the magnetic field at center is $\frac{\mu_0 I}{4R}$.

(NEW NCERT 12th Page No. 115)

31. (4)

$$\vec{F}=q(\vec{V}\times\vec{B})$$

$\vec{F}\perp\vec{V}$ and $\vec{F}\perp\vec{B}$

(NEW NCERT 12th Page No. 109)

32. (2)

$$\phi=BA\cos\omega t$$

$$|e|=\frac{d\phi}{dt}=BA\omega\sin\omega t$$

$$i=\frac{|e|}{R}=\frac{BA\omega}{R}\sin\omega t$$

Power $P=i^2R=\frac{B^2A^2\omega^2}{R}\sin^2\omega t$

$$P_m=\frac{B^2A^2\omega^2}{R}(\sin^2\omega t)_m$$

$$=\frac{B^2\pi^2r^4\omega^2}{2R} \qquad \left[(\sin^2\omega t)_m=\frac{1}{2}\right]$$

(NEW NCERT 12th Page No. 162)

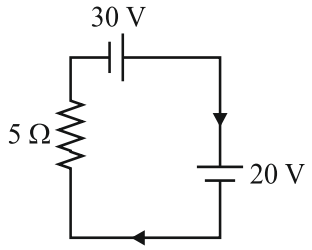
33. **(1)**

$\mu_r = 1 + \chi$

(NEW NCERT 12th Page No. 147)

34. **(1)**

Induce emf = 20 V



i = 2A clockwise

(NEW NCERT 12th Page No. 163)

35. **(1)**

$$P_S = \frac{P_1 P_2}{P_1 + P_2} = 50\,\text{W}$$

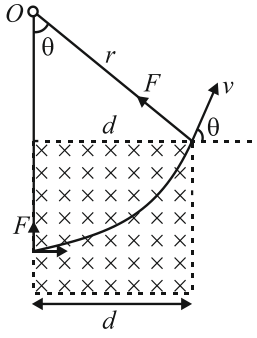
(NEW NCERT 12th Page No. 92)

SECTION-B

36. **(2)**

The radius of the circular orbit is $r = \frac{mv}{qB}$

The deviation θ may be obtained from the figure.

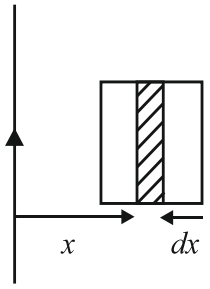


As $\sin\theta = \frac{d}{r} = \frac{dBq}{mv}$ or $\theta = \sin^{-1}\left(\frac{dBq}{mv}\right)$

(NEW NCERT 12th Page No. 112)

37. **(1)**

Consider a strip of width *dx* at a distance *x* from the wire.



$$\int d\phi = \int_d^{d+\ell} \frac{\mu_0 I}{2\pi x}\,\ell\,dx$$

$$\phi = \frac{\mu_0 I \ell}{2\pi}\ln\left(\frac{d+\ell}{d}\right)$$

(NEW NCERT 12th Page No. 156)

38. **(2)**

For any material $\varepsilon_r > 1$.

For diamagnetic $\mu_r < 1$.

$\therefore$ option 2 is correct

(NEW NCERT 12th Page No. 147)

39. **(3)**

$$V_{rms} = \sqrt{\frac{\int_0^T V^2 dt}{T}}$$

$$= \sqrt{\frac{\int_0^T V_m^2 \sin^2\omega t dt}{T}}$$

$$\Rightarrow \sqrt{\frac{V_m^2}{T}\int_0^T \sin^2\omega t dt}$$

$$= \frac{V_m}{\sqrt{T}}\sqrt{2\int_0^{\frac{T}{2}}\left(\frac{1-\cos 2\omega t}{2}\right)dt}$$

$$= \frac{V_m}{\sqrt{T}}\left(\frac{\sqrt{T}}{2}\right) = \frac{V_m}{2}$$

(NEW NCERT 12th Page No. 177)

40. **(2)**

For net force to become zero the electrostatic force and magnetic force should be antiparallel.

In option 2 net force may be zero.

(NEW NCERT 12th Page No. 112)

41. **(1)**

The magnetic susceptibility of diamagnetic material is low and negative.

(NEW NCERT 12th Page No. 146)

42. **(2)**

$|e| = (\vec{v} \times \vec{B}).\vec{\ell}_{eff}$

$$e = 2vB\left[\ell\sin\left(\frac{\theta}{2}\right)\right]$$

(NEW NCERT 12th Page No. 162)

43. **(3)**

As the coil and bulb are connected to a DC source, it is *a* LR circuit with current growing exponentially.

Current at any time *t*

$$I = \frac{V}{R}\left(1 - e^{\frac{-t}{\tau}}\right)$$

After a long time $I = I_{\max} = \frac{V}{R}$

$\therefore$ No effect of soft iron core on the maximum value of current.

(NEW NCERT 12th Page No. 181)

44. (2)

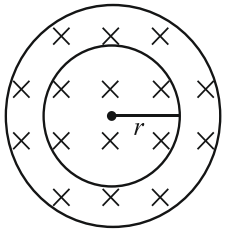
$$\frac{V_2}{V_1}=\frac{N_2}{N_1}=\frac{8}{1}$$

$$V_2=8\times120=960\,\text{Volt}$$

$$I=\frac{960}{10^4}=96\,\text{mA}$$

(NEW NCERT 12th Page No. 194)

45. (1)



$$\oint\vec{E}.\vec{dl}=\left|\frac{-d\phi}{dt}\right|$$

$$E(2\pi r)=\pi r^2\frac{dB}{dt}$$

$$E_i=\frac{r}{2}\frac{dB}{dt}$$

$E_{\text{inside}}\propto r$

For outside

$$E(2\pi r)=\pi R^2\left(\frac{dB}{dt}\right)$$

$$E_{\text{outside}}\propto\frac{1}{r}$$

(NEW NCERT 12th Page No. 163)

46. (1)

Charge will flow from high potential to low potential $V_A=\frac{KQ}{R}$

$$V_B=\frac{K(2Q)}{4R}=\frac{KQ}{2R}$$

$V_A>V_B$

$\therefore$ Charge flows from A towards B till potential becomes equal.

(NEW NCERT 12th Page No. 61)

47. (4)

The electric field in the Gauss law is due to all the charges whether present inside or outside.

(NEW NCERT 12th Page No. 29)

48. (3)

The electromagnetic wave is along $\vec{E}\times\vec{B}$.

(NEW NCERT 12th Page No. 205)

49. (2)

$$T=2\pi\sqrt{\frac{L}{g_{eff}}}$$

Where $g_{eff}=g-\frac{qE}{m}$

(NEW NCERT 12th Page No. 16)

50. (3)

Decay of current

$$I=I_0e^{-\frac{t}{\tau}}$$

$$18=20\,e^{-\frac{2}{\tau}}$$

$$\frac{10}{9}=e^{\frac{2}{\tau}}$$

$$\ln\left(\frac{10}{9}\right)=\frac{2}{\tau}$$

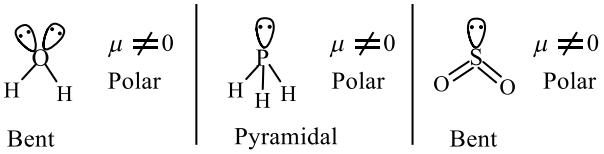
$$\tau=\frac{2}{\ln\left(\frac{10}{9}\right)}$$

(NEW NCERT 12th Page No. 166)

(CHEMISTRY)

SECTION-A

51. (4)



So all are polar molecule.

(NEW NCERT 11th Part-I Page No. 110)

52. (1)

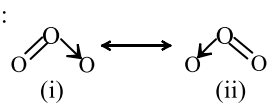
The correct order of dipole moment is:

$HF > H_2O > NH_3 > HCl > NF_3$

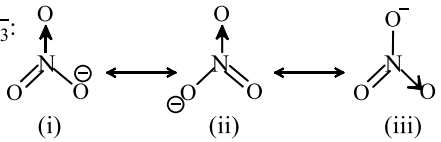
(NEW NCERT 11th Part-I Page No. 110)

53. (4)

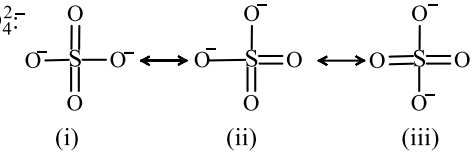
O_3:



NO_3^-:



SO_4^{2-}:

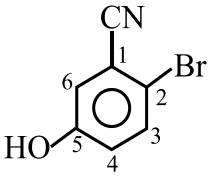


Hence all show resonance.

(NEW NCERT 11th Part-I Page No. 109)

54. (2)

The IUPAC name of the given compound is 2-Bromo-5-hydroxybenzonitrile



(NEW NCERT 11th Part-II Page No. 269)

55. (1)

(A)	O_2^+	(IV)	$2\frac{1}{2}$ and paramagnetic
(B)	O_2	(III)	2 and paramagnetic
(C)	O_2^-	(II)	$1\frac{1}{2}$ and paramagnetic
(D)	O_2^{2-}	(I)	1 and diamagnetic

(NEW NCERT 11th Part-I Page No. 129)

56. (3)

The bond order of C_2 is 2 and C_2 molecule has 2π bond.

(NEW NCERT 11th Part-I Page No. 130)

57. (3)

The hybridisation of Ni in $[Ni(CN)_4]^{2-}$ is dsp^2 and it has square planar shape.

(NEW NCERT 12th Part-I Page No. 129)

58. (1)

In sp^3d hybridisation d_{z^2}, orbital is used.

(NEW NCERT 12th Part-I Page No. 115)

59. (1)

$$\pi V = \frac{w}{MM}RT$$

$$\pi = \frac{w}{MM} \times \frac{RT}{V}$$

$$\pi = \frac{50 \times 0.0821 \times 298}{60 \times 1}$$

$$\pi = 20.39 \text{ atm}$$

(NEW NCERT 12th Part-I Page No. 21)

60. (4)

For solution showing negative deviation from Raoult's law,

(1) $P_A < P_A^0 X_A$ and $P_B < P_B^0 X_B$

(2) $\Delta H_{mixing} < 0$

(3) $\Delta V_{mixing} < 0$

(NEW NCERT 12th Part-I Page No. 14)

61. (3)

The molar mass of the solute is given by,

$$M.M = \frac{1000 \times K_b \times w}{W \times \Delta T_b}$$

$$M.M = \frac{1000 \times 0.52 \times 12.5}{200 \times 1} = 32.5 \text{ g/mol.}$$

(NEW NCERT 12th Part-I Page No. 17)

62. (2)

Degree of dissociation a of $Ca(NO_3)_2 = \frac{70}{100} = 0.7$

$$Ca(NO_3)_2 \rightleftharpoons Ca^{2+} + 2NO_3^-$$

Initial	1	0	0
At eqn.	(1 – 0.7)	0.7	2×0.7

Total number of moles in solution

= (1 – 0.7) + 0.7 + (2 × 0.7)

= 2.4

$$\therefore i = \frac{\text{No. of moles in solution}}{\text{No. of moles added}} = \frac{2.4}{1} = 2.4$$

(NEW NCERT 12th Part-I Page No. 24)

63. (4)

$Ohm^{-1}\ cm^{-1}$, $\Omega^{-1}\ cm^{-1}$ and $S\ cm^{-1}$ all of these are unit of specific conductivity.

(NEW NCERT 12th Part-I Page No. 44)

64. (1)

$$\kappa = \frac{1}{R} \times \frac{l}{A}$$

$$\kappa = \frac{1}{30} \times \frac{30}{100} = \frac{1}{100} ohm^{-1}cm^{-1}$$

$$\Lambda_m = \frac{\kappa \times 1000}{\text{Molarity}}$$

$$= \frac{1 \times 1000}{100 \times 0.01} = 1000 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}.$$

(NEW NCERT 12th Part-I Page No. 46)

65. (1)

For a weak electrolyte there is a steep rise in the molar conductivity of the solution on dilution and as dilution increases, ionisation of weak electrolyte increases.

(NEW NCERT 12th Part-I Page No. 47)

66. (2)

According to Kohlrausch's Law,

$$\Lambda_m[Al_2(SO_4)_3] = 2\Lambda^\infty_{Al^{3+}} + 3\Lambda^\infty_{SO_4^{2-}}$$

= 2×190 + 3×160

= 860 $ohm^{-1}\ cm^2\ mol^{-1}$.

(NEW NCERT 12th Part-I Page No. 49)

67. (3)

Lower the reduction potential higher will be reducing power.

So the correct order is D < B < A < C.

(NEW NCERT 12th Part-I Page No. 37)

68. (2)

At anode, $Ni \rightarrow Ni^{2+} + 2e^-$

At cathode, $2Ag^+ + 2e^- \rightarrow 2Ag$

$E^0_{cell} = E^0_C - E^0_A$

= 0.80 – (–0.25) = 1.05 V

$\Delta G^o = -nF\,E^\circ_{cell}$

= –2×96500×1.05

= –202650 J

(NEW NCERT 12th Part-I Page No. 40)

69. (3)

The reduction reaction in acidic medium

$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O$

1mole 5F

For 1mole reduction of MnO_4^- = 5F

For 1.5 moles of MnO_4^- = 5 × 1.5 × 96500

= 723750 C.

(NEW NCERT 12th Part-I Page No. 52)

70. (4)

For free energy change and equilibrium constant, the value of $\Delta G^o = -2.303 \log K_C$ and at equilibrium, change in Gibbs free energy is equal to zero.

(NEW NCERT 11th Part-I Page No. 162)

71. (2)

The dimerisation reaction can be written as:

$2A \rightarrow A_2$

Rate = $k[A]^2$

$9.5\times10^{-4} = k(0.02)^2$

$k = \dfrac{9.5\times10^{-4}}{(0.02)^2}$

$k = 2.4\ mol^{-1}\ L\ s^{-1}$

(NEW NCERT 12th Part-I Page No. 65)

72. (4)

For I[st] order reaction

$t_{\frac{1}{2}} = \dfrac{0.693}{k}$

slope = $\dfrac{-k}{2.303}$ and $k = \dfrac{-2.303}{t}\log\dfrac{[A]}{[A_0]}$

So, option (1) and (3) are correct.

(NEW NCERT 12th Part-I Page No. 74,76)

73. (2)

$t_{\frac{1}{2}} = \dfrac{0.693}{k} = 1$

$k = 0.693$

$t = \dfrac{2.303}{k}\log\dfrac{[A_0]}{[A]}$

$t = \dfrac{2.303}{0.693}\log\dfrac{[0.6]}{[0.1]}$

$t = \dfrac{2.303}{0.693}(\log 6) = \dfrac{2.303}{0.693}\times(0.7781)$

= 2.58 min.

∴ time required to reduce 0.1 mol L^{-1} from 0.6 mol L^{-1} is 2.58 min.

(NEW NCERT 12th Part-I Page No. 76)

74. (3)

Arrehenius equation is,

$k = Ae^{\frac{-E_a}{RT}}$

Options (3) is incorrect, as temperature increases rate of reaction increases.

(NEW NCERT 12th Part-I Page No. 79)

75. (1)

The slope of the line in plot of log k versus $\dfrac{1}{T}$ is given by;

Slope = $\dfrac{-E_a}{2.303}\times\dfrac{1}{R}$

E_a = –2.303 × 8.314 (–5000)

= 95.73 kJ mol^{-1}

(NEW NCERT 12th Part-I Page No. 80)

76. (1)

Molecularity has no meaning for complex reaction and the molecularity of reaction more than 3 is very rare.

(NEW NCERT 12th Part-I Page No. 69)

77. (4)

Let, $r = k[A]^x [B]^y$ …….(1)

When concentration of B becomes double

$r_1 = 2r$

$2r = k[A]^x[2B]^y$ …….(2)

By solving equation (1) and (2) value of y = 1.

When concentration of both A and B double.

$r_2 = 8r$, $8r = [2A]^x [2B]^y$……..(III)

By solving equation (1) and (3) we get x = 2

∴ rate law = $k[A]^2[B]^1$

(NEW NCERT 12th Part-I Page No. 67)

78. (2)

$CH_3–CH_2–CH=CH_2$ does not show geometrical isomerism because it has two hydrogen atom attached to the double bonded carbon atom.

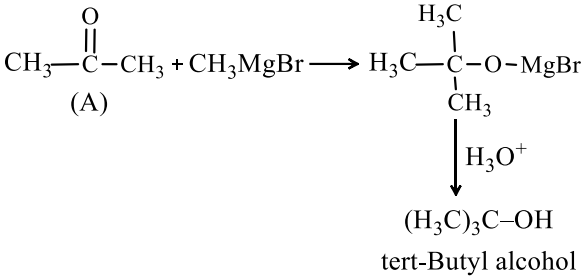
(NEW NCERT 11th Part-II Page No. 308)

79. (2)

$$CH_3COOCH_3 \xrightarrow{LiAlH_4} \underset{(A)}{CH_3CH_2–OH} \xrightarrow[\Delta]{\text{conc HCl, AnhyZnCl}_2} \underset{(B)}{CH_3CH_2Cl}$$

(NEW NCERT 12th Part-II Page No. 200,208)

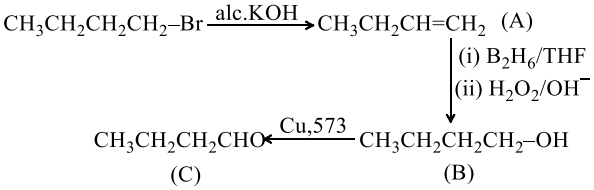
80. (2)



A in the above reaction is acetone.

(NEW NCERT 12th Part-II Page No. 201)

81. (3)



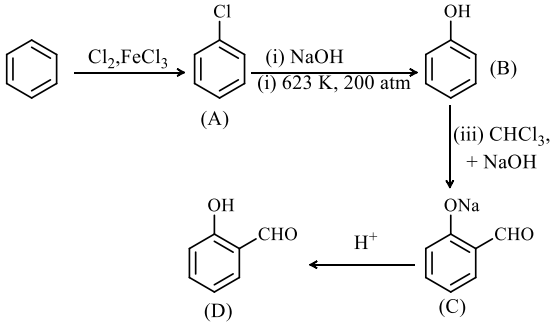
(NEW NCERT 12th Part-II Page No. 200)

82. (2)

We can differentiate 1º, 2º and 3º alcohols by Lucas reagent and Lucas reagent is a mixture of concentrated HCl and anhydrous $ZnCl_2$ in the ratio 1 : 1.

(NEW NCERT 12th Part-II Page No. 208)

83. (2)



(NEW NCERT 12th Part-II Page No. 202,213)

84. (1)

As overall effect of chlorine is –I effect, any substituent which decreases electron density over the ring increase the acidic character, so correct order is,

O–chlorophenol > m–chlorophenol > p–chlorophenol > phenol.

(NEW NCERT 12th Part-II Page No. 206)

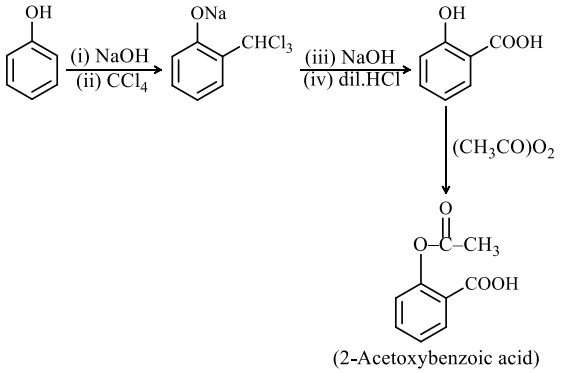
85. (2)

The boiling point of phenol is more than that of chlorobenzene and the molecular mass of chlorobenzene is more than that of phenol.

(NEW NCERT 12th Part-II Page No. 206)

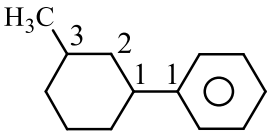
SECTION-B

86. (4)



(NEW NCERT 12th Part-II Page No. 208,213)

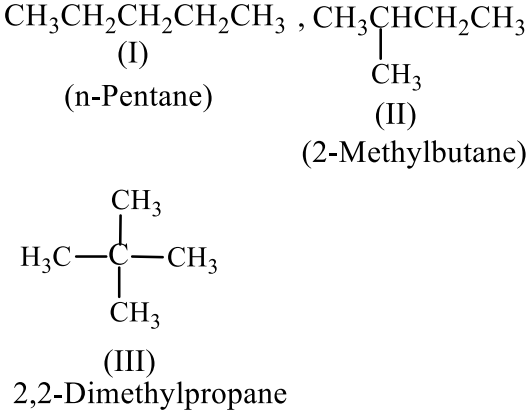
87. (2)



1–(3–Methylcyclohexyl)benzene

(NEW NCERT 11th Part-II Page No. 269)

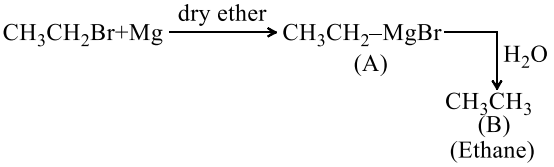
88. (1)



So, pentane has 3 chain isomers.

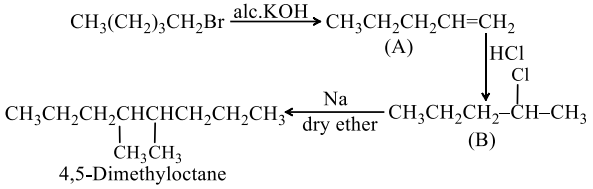
(NEW NCERT 11th Part-II Page No. 270)

89. (3)



(NEW NCERT 12th Part-II Page No. 181)

90. (4)



(NEW NCERT 11th Part-II Page No. 301,310)

91. (4)

For s-subshell, $l = 0$, m = 0

For p-subshell, $l = 1$, m = –1, 0, +1

For d-subshell, $l = 2$, m = –2, –1, 0, +1, +2

For f-subshell, $l = 3$, m = –3, –2, –1, 0, +1, +2, +3

Option (1) and (2) do not belong to p subshell.

(NEW NCERT 11th Part-I Page No. 55)

92. (1)

$$E_n = \frac{-2.18\times10^{-18}}{n^2} \text{ J atom}^{-1}$$

$$\Delta E = E_4 - E_3 = 2.18\times10^{-18}\left[\frac{1}{(3)^2} - \frac{1}{(4)^2}\right]$$

$= 1.059\times10^{-19}$ J atom^{-1}

$\Delta E = h\nu$

$$\nu = \frac{1.059\times10^{-19}}{6.626\times10^{-34}} = 1.6\times10^{14} \text{ sec}^{-1}$$

(NEW NCERT 11th Part-I Page No. 48)

93. (4)

$N_1V_1 + N_2V_2 + N_3V_3 = NV$ (Solution)

$$1\times10 + \frac{1}{2}\times40 + \frac{1}{3}\times60 = N\times2000$$

$$N = \frac{10+20+20}{2000} = \frac{1}{40}$$

$$N = \frac{N}{40}$$

(NEW NCERT 11th Part-I Page No. 24)

94. (2)

Mole fraction of H_2O = 0.78

Mole fraction of HCl = 1–0.78 = 0.22

$$\frac{n_1}{n_1+n_2} = 0.22 \ldots\ldots\ldots(1)$$

$$\frac{n_2}{n_1+n_2} = 0.78 \ldots\ldots\ldots(2)$$

Dividing equation (1) by equation (2) we have

$$\frac{n_1}{n_2} = \frac{0.22}{0.78} = 0.28 \ldots\ldots\ldots(3)$$

$$n_2 = \frac{1000}{18} = 55.55$$

Put value of n_2 in equation (3) we have

$$\frac{n_1}{55.55} = 0.28$$

$n_1 = 0.28\times55.55 = 15.95$

Hence the molality of the given solution is 15.95 m.

(NEW NCERT 11th Part-I Page No. 23,24)

95. (1)

Boron and oxygen have lower ionisation energies as compared to beryllium and nitrogen respectively and Mg has higher ionisation energy than Na and Al.

(NEW NCERT 11th Part-I Page No. 84)

96. (4)

Stability of carbocation $\propto$ no. of α C–H bonds and

$$\propto \frac{1}{sp^2 \text{ hybridisation of carbon atom}}$$

So, the correct order of carbocation is

IV > III > II > I

(NEW NCERT 11th Part-II Page No. 277)

97. (2)

Since hydrogen is assumed to behave as an ideal gas, the final volume of gas is,

$$V = \frac{nRT}{P} = \frac{10\times0.0821\times300}{1} = 246.3\,L$$

ΔV = 246.3–5 = 241.3 L

$W = -P\Delta V$

$= -1\times(241.3)$ L atm

$= -241.3\times101.3$ J

$= -24.4$ kJ.

(NEW NCERT 11th Part-I Page No. 142,143)

98. (2)

If ΔS total is positive, the process is spontaneous in the direction as mentioned and the change in entropy (ΔS) is an extensive property and unit of entropy is JK^{-1} mol^{-1}.

(NEW NCERT 11th Part-I Page No. 158)

99. (1)

(A) C_3O_2 —— (III) $+\frac{4}{3}$

(B) $Na_2S_4O_6$ —— (IV) $+\frac{5}{2}$

(C) Br_3O_8 —— (II) $+\frac{16}{3}$

(D) CrO_5 —— (I) +6

(E) MnO_4^- —— (V) +7

(NEW NCERT 11th Part-II Page No. 245)

100. (4)

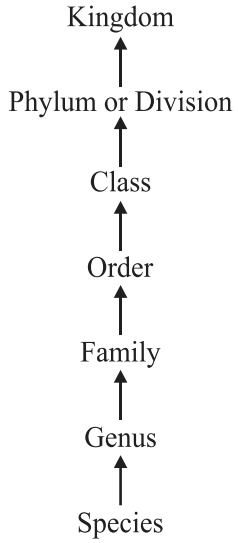
The oxidation state of B in $NaBH_4$ is +3 and in $S_4O_6^{2-}$, the oxidation state of each sulphur is 0 and +5.

(NEW NCERT 11th Part-II Page No. 239)

(BOTANY)

SECTION-A

101. (3)



(NEW NCERT 11th Page No. 08)

102. (3)

The 'Roquefort cheese' are ripened by growing a specific fungi on them, which gives them a particular flavour.

(NEW NCERT 12th Page No. 151)

103. (2)

Integuments of ovules harden as tough protective seed coats. The micropyle remains as a small pore in the seed coat.

(NEW NCERT 12th Page No. 20)

104. (4)

Examples of acid producers are *Aspergillus niger* (a fungus) of citric acid, *Acetobacter aceti* (a bacterium) of acetic acid; *Clostridium butylicum* (a bacterium) of butyric acid.

Yeast (*Saccharomyces cerevisiae*) is used for commercial production of ethanol.

(NEW NCERT 12th Page No. 153)

105. (1)

Primary treatment: These treatment steps basically involve physical removal of particles – large and small – from the sewage through filtration and sedimentation.

(NEW NCERT 12th Page No. 154)

106. (1)

Bacteria are grouped under four categories based on their shape: the spherical Coccus (pl.: cocci), the rod-shaped Bacillus (pl.: bacilli), the comma-shaped Vibrium (pl.: vibrio) and the spiral Spirillum (pl.: spirilla).

(NEW NCERT 11th Page No. 12)

107. (3)

Many members of the genus *Glomus* form mycorrhiza.

(NEW NCERT 12th Page No. 158)

108. (3)

Species of *Sphagnum*, a moss, provide peat that have long been used a fuel, and as packing material for trans-shipment of living material because of their capacity to hold water.

(NEW NCERT 11th Page No. 29)

109. (3)

Lipases are used in detergent formulations and are helpful in removing oily stains from the laundry.

Bottled fruit juices bought from the market are clearer as compared to those made at home. This is because the bottled juices are clarified by the use of pectinases and proteases.

(NEW NCERT 12th Page No. 153)

110. (3)

The cell cycle is divided into two basic phases: Interphase and M Phase (Mitosis phase).

The M Phase represents the phase when the actual cell division or mitosis occurs and the interphase represents the phase between two successive M phases.

(NEW NCERT 11th Page No. 121)

111. (3)

Hershey and Chase	Proved that DNA is the genetic material
Watson and Crick	Proposed double helix model for the structure of DNA
Avery, MacLeod and McCarty	Discovered that proteases and RNases did not affect transformation
Griffith	Transformation in bacteria

(NEW NCERT 12th Page No. 81, 84, 85)

112. (4)

A flower is a modified shoot wherein the shoot apical meristem changes to floral meristem.

(NEW NCERT 11th Page No. 61)

113. (4)

Species A	Species B	Name of Interaction
+	+	Mutualism
–	–	Competition
+	–	Predation
+	–	Parasitism
+	0	Commensalism
–	0	Amensalism

(NEW NCERT 12th Page No. 197)

114. (2)

Sclerenchyma consists of long, narrow cells with thick and lignified cell walls having a few or numerous pits. They are usually dead and without protoplasts.

(OLD NCERT 11th Page No. 86)

115. (4)

In general, herbivores and plants appear to be more adversely affected by competition than carnivores.

(NEW NCERT 12th Page No. 199)

116. (3)

Host in brood parasitism	Crow
Barnacles growing on the back of a whale	Commensal relationship
Visiting flamingoes and resident fishes in shallow south American lakes	Compete for zooplanktons
Fig and pollinator wasp	Co-evolution

(NEW NCERT 12th Page No. 198, 201, 202)

117. (1)

The cell envelope consists of a tightly bound three layered structure i.e., the outermost glycocalyx followed by the cell wall and then the plasma membrane. Although each layer of the envelope performs distinct function, they act together as a single protective unit. Bacteria can be classified into two groups on the basis of the differences in the cell envelopes and the manner in which they respond to the staining procedure developed by Gram viz., those that take up the gram stain are Gram positive and the others that do not are called Gram negative bacteria.

(NEW NCERT 11th Page No. 90)

118. (3)

Under normal conditions, births and deaths are the most important factors influencing population density, the other two factors assuming importance only under special conditions.

(NEW NCERT 12th Page No.193)

119. (2)

The autotrophic components include the phytoplankton, some algae and the floating, submerged and marginal plants found at the edges. The consumers are represented by the zooplankton, the free swimming and bottom dwelling forms. The decomposers are the fungi, bacteria and flagellates especially abundant in the bottom of the pond.

(NEW NCERT 12th Page No. 206)

120. (3)

The kangaroo rat in North American deserts is capable of meeting all its water requirements through its internal fat oxidation (in which water is a by product).

(OLD NCERT 12th Page No. 225)

121. (2)

Plants capture only 2-10 per cent of the PAR and this small amount of energy sustains the entire living world.

(NEW NCERT 12th Page No. 209)

122. (3)

Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called as catabolism.

Detritivores (e.g., earthworm) break down detritus into smaller particles. This process is called fragmentation.

By the process of leaching, water soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts.

Humification leads to accumulation of a dark coloured amorphous substance called humus that is highly resistant to microbial action and undergoes decomposition at an extremely slow rate.

(NEW NCERT 12th Page No. 207, 208)

123. (2)

The complex formed by a pair of synapsed homologous chromosomes is called a bivalent or a tetrad.

(NEW NCERT 11th Page No. 126)

124. (3)

The energy transfer follows 10% law. Accordingly, T_2 level will have 1000 J of energy.

(NEW NCERT 12th Page No. 213)

125. (2)

Pyramid of energy is always upright, can never be inverted, because when energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step.

(NEW NCERT 12th Page No. 213)

126. (3)

There are certain limitations of ecological pyramids such as it does not take into account the same species belonging to two or more trophic levels. It assumes a simple food chain, something that almost never exists in nature; it does not accommodate a food web.

(NEW NCERT 12th Page No. 214)

127. (2)

The annual net primary productivity of the whole biosphere is approximately 170 billion tons (dry weight) of organic matter. Of this, despite occupying about 70 percent of the surface, the productivity of the oceans are only 55 billion tons.

(NEW NCERT 12th Page No. 207)

128. (4)

Green colour of seed is a recessive trait.

(NEW NCERT 12th Page No. 54)

129. (1)

The law of dominance is used to explain the expression of only one of the parental characters in a monohybrid cross in the F_1 and the expression of both in the F_2. It also explains the proportion of 3:1 obtained at the F_2.

(NEW NCERT 12th Page No. 59)

130. (3)

Red eye, brown body and long wings are the characters present in wild *Drosophila.*

(NEW NCERT 12th Page No. 68)

131. (4)

In 1900, three Scientists (de Vries, Correns and von Tschermak) independently rediscovered Mendel's results on the inheritance of characters. By 1902, the chromosome movement during meiosis had been worked out.

(NEW NCERT 12th Page No. 65)

132. (3)

In humans and *Drosophila*, XX-XY system of sex-determination is seen. In human beings and in *Drosophila* the males have one X and one Y chromosome, whereas females have a pair of X-chromosomes besides autosomes. Birds show female heterogamety.

Grasshopper is an example of XO type of sex determination in which the males have only one X-chromosome besides the autosomes, whereas females have a pair of X-chromosomes.

Honey bee shows haplo-diploid sex-determination system.

(NEW NCERT 12th Page No. 70, 71)

133. (2)

Starch synthesis in pea seeds is controlled by one gene.

(NEW NCERT 12th Page No. 62)

134. (4)

The pattern of inheritance of such Mendelian disorders can be traced in a family by the pedigree analysis. Most common and prevalent Mendelian disorders are Haemophilia, Cystic fibrosis, Sickle-cell anaemia, Colour blindness, Phenylketonuria, Thalassemia, etc.

(NEW NCERT 12th Page No. 73)

135. (2)

Down's Syndrome: The cause of this genetic disorder is the presence of an additional copy of the chromosome number 21 (trisomy of 21). This disorder was first described by Langdon Down (1866). The affected individual is short statured with small round head, furrowed tongue and partially open mouth. Palm is broad with characteristic palm crease. Physical, psychomotor and mental development is retarded.

(NEW NCERT 12th Page No. 76)

SECTION-B

136. (2)

Alexander Fleming while working on *Staphylococci* bacteria, once observed a mould growing in one of his unwashed culture plates around which *Staphylococci* could not grow. He found out that it was due to a chemical produced by the mould and he named it Penicillin after the mould *Penicillium notatum*. However, its full potential as an effective antibiotic was established much later by Ernest Chain and Howard Florey. This antibiotic was extensively used to treat American soldiers wounded in World War II.

(NEW NCERT 12th Page No. 152)

137. (3)

During reduction, carbohydrate is formed at the expense of the photochemically made ATP and NADPH.

(NEW NCERT 11th Page No. 144)

138. (4)

During anaerobic treatment of sewage, bacteria produce a mixture of gases such as methane, hydrogen sulphide and carbon dioxide. These gases form biogas and can be used as source of energy as it is inflammable.

(NEW NCERT 12th Page No. 154)

139. (1)

Even a plant species, which makes its own food, cannot survive alone; it needs soil microbes to break down the organic matter in soil and return the inorganic nutrients for absorption.

(NEW NCERT 12th Page No. 196)

140. (3)

The fructose 1, 6-bisphosphate is split into dihydroxyacetone phosphate and 3-phosphoglyceraldehyde (PGAL).

(NEW NCERT 11th Page No. 156)

141. (2)

Verhulst-Pearl Logistic Growth is described by the following equation:

$dN/dt = rN\left(\frac{K - N}{K}\right)$ Where,

N = Population density at time t

r = Intrinsic rate of natural increase

K = Carrying capacity

(NEW NCERT 12th Page No. 195)

142. (2)

A species whose distribution is restricted to a small geographical area because of the presence of a competitively superior species, is found to expand its distributional range dramatically when the competing species is experimentally removed. This is called competitive release. Gause's '*Competitive Exclusion Principle'* states that two closely related species competing for the same resources cannot co-exist indefinitely and the competitively inferior one will be eliminated eventually. If two species compete for the same resource, they could avoid competition by choosing, for instance, different times for feeding or different foraging patterns, is called resource partitioning.

(NEW NCERT 12th Page No. 199)

143. (3)

Auxin	Oats
Gibberellin	Rice
Cytokinin	Tobacco
Ethylene	Orange

(NEW NCERT 11th Page No. 175)

144. (1)

Decomposition rate is slower if detritus is rich in lignin and chitin, and quicker, if detritus is rich in nitrogen and water-soluble substances like sugars. Temperature and soil moisture are the most important climatic factors that regulate decomposition through their effects on the activities of soil microbes.

(NEW NCERT 12th Page No. 208)

145. (3)

Inverted pyramid of biomass-small standing crop of phytoplankton supports large standing crop of zooplankton.

(NEW NCERT 12th Page No. 212)

146. (1)

In the polar seas aquatic mammals like seals have a thick layer of fat (blubber) below their skin that acts as an insulator and reduces loss of body heat. Desert lizards lack the physiological ability that mammals have to deal with the high temperatures of their habitat, but manage to keep their body temperature fairly constant by behavioural means.

(OLD NCERT 12th Page No. 226)

147. (1)

Sickle cell anaemia is a Mendelian disorder.

(NEW NCERT 12th Page No. 74)

148. (2)

This inborn error of metabolism is inherited as the autosomal recessive trait. The affected individual lacks an enzyme that converts the amino acid phenylalanine into tyrosine. As a result of this phenylalanine is accumulated and converted into phenylpyruvic acid and other derivatives. Accumulation of these in brain results in mental retardation. These are also excreted through urine because of its poor absorption by kidney.

(NEW NCERT 12th Page No. 75)

149. (1)

The plant growth regulators (PGRs) are small, simple molecules of diverse chemical composition.

(NEW NCERT 11th Page No. 174)

150. (2)

Statins produced by the yeast *Monascus purpureus* have been commercialised as blood-cholesterol lowering agents.

(NEW NCERT 12th Page No. 153)

(ZOOLOGY)

SECTION-A

151. (4)

The male accessory glands include paired seminal vesicles, a prostate and paired bulbourethral glands. Secretions of these glands constitute the seminal plasma which is rich in fructose, calcium and certain enzymes. The secretions of bulbourethral glands also helps in the lubrication of the penis.

If it is removed then copulation and fertilisation will be affected.

(NEW NCERT 12th Page No. 28)

152. (1)

With repeated use of drugs, the tolerance level of the receptors present in our body increases. This leads to addiction of drugs.

(NEW NCERT 12th Page No. 145)

153. (4)

Periodic abstinence is the method in which the couples avoid or abstain from coitus from day 10 to 17 of the menstrual cycle when ovulation could be expected. As chances of fertilisation are very high during this period, it is called the fertile period. Therefore, by abstaining from coitus during this period, conception could be prevented.

(NEW NCERT 12th Page No. 44)

154. (2)

Cancer cells appears to have lost contact inhibition property. As a result of this, cancerous cells just continue to divide giving rise to masses of cells called tumors.

(NEW NCERT 12th Page No. 141)

155. (1)

The spermatids are transformed into spermatozoa (sperms) by the process called spermiogenesis. During this stage sperm acquire whole structural maturity.

(NEW NCERT 12th Page No. 31)

156. (2)

In radiotherapy, tumor cells are irradiated lethally, taking proper care of the normal tissues surrounding the tumor mass.

(NEW NCERT 12th Page No. 142)

157. (1)

Infertility cases either due to inability of the male partner to inseminate the female or due to very low sperm counts in the ejaculates, could be corrected by artificial insemination (AI) technique.

(NEW NCERT 12th Page No. 48)

158. (3)

After maturation the lymphocytes migrate to secondary lymphoid organs like spleen, lymph nodes, tonsils, Peyer's patches of small intestine and appendix.

(NEW NCERT 12th Page No. 138)

159. (1)

The menstrual phase is followed by the follicular phase. During this phase, the primary follicles in the ovary grow to become a fully mature Graafian follicle and simultaneously the endometrium of uterus regenerates through proliferation. Rapid secretion of LH leading to its maximum level during the mid-cycle called LH surge induces rupture of Graafian follicle and thereby the release of ovum (ovulation).

(NEW NCERT 12th Page No. 35)

160. (3)

The effective and popular method of birth control is the use of Intra Uterine Devices (IUDs). These devices are inserted by doctors or expert nurses in the uterus through vagina. These Intra Uterine Devices are presently available as the non-medicated IUDs (e.g., Lippes loop), copper releasing IUDs (CuT, Cu7, Multiload 375) and the hormone releasing IUDs (Progestasert, LNG-20).

(NEW NCERT 12th Page No. 44)

161. (3)

The mitotic division starts as the zygote moves through the isthmus of the oviduct called cleavage towards the uterus and forms 2, 4, 8, 16 daughter cells called blastomeres. So total number of cleavage is 4.

(NEW NCERT 12th Page No. 36)

162. (4)

The immune system plays an important role in allergic reactions, auto- immune diseases and organ transplantation.

(NEW NCERT 12th Page No. 137)

163. (1)

Except for hepatitis-B, genital herpes and HIV infections, other diseases are completely curable if detected early and treated properly.

(NEW NCERT 12th Page No. 47)

164. (4)

The clitoris is a tiny finger-like structure which lies at the upper junction of the two labia minora above the urethral opening.

(NEW NCERT 12th Page No. 30)

165. (2)

The use of drugs like anti-histamine, adrenaline and steroids quickly reduce the symptoms of allergy.

(NEW NCERT 12th Page No. 137)

166. (3)

The Medical Termination of Pregnancy (Amendment) Act, 2017 was enacted by the government of India with the intension of reducing the incidence of illegal abortion and consequent maternal mortality and morbidity. According to this Act, a pregnancy may be terminated on certain considered grounds within the first 12 weeks of pregnancy on the opinion of one registered medical practitioner. If the pregnancy has lasted more than 12 weeks, but fewer than 24 weeks, two registered medical practitioners must be of the opinion, formed in good faith, that the required ground exist. The grounds for such termination of pregnancies are: (i) The continuation of the pregnancy would involve a risk to the life of the pregnant woman or of grave injury physical or mental health; or (ii There is a substantial risk that of the child were born, it would suffer from such physical or mental abnormalities as to be seriously handicapped.

(NEW NCERT 12th Page No. 46)

167. (2)

The male sex accessory glands include paired seminal vesicles, a prostate and paired bulbourethral glands.

Each seminiferous tubule is lined on its inside by two types of cells called male germ cells (spermatogonia) and Sertoli cells.

(NEW NCERT 12th Page No. 27, 28)

168. (4)

The correct statement are:

A. Yoga has been practised to achieve physical and mental health.
B. Infectious diseases are very common and everyone of us suffers from these at sometime or other.
C. AIDS is an infectious disease.
D. Cancer is non - infectious disease.
E. Healthy persons bring economic prosperity.

(NEW NCERT 12th Page No. 130)

169. (3)

Pollens, mites of dust, animal danger etc are example of allergens which causes allergy in our body that produce antibody IgE.

(NEW NCERT 12th Page No. 137)

170. (4)

Prevention or early detection and cure of sexually transmitted diseases are given prime consideration under the reproductive health-care programmes.

(NEW NCERT 12th Page No. 47)

171. (1)

The side effect of the use of anabolic drugs which is common in males and females are: increased aggressiveness, mood swings, depressions.

(NEW NCERT 12th Page No. 146)

172. (3)

In human beings, menstrual cycles ceases around 50 years of age; that is termed as menopause. Cyclic menstruation is an indicator of normal reproductive phase and extends between menarche and menopause.

(NEW NCERT 12th Page No. 35)

173. (3)

Saheli is an oral contraceptive which prevents ovulation i.e., release of ovum but does not block transport of gamete.

(NEW NCERT 12th Page No. 45)

174. (1)

List-I	List-II
Widal test	Typhoid fever
ELISA test	AIDS
Helper T-cells	Activation of B-cell
Treatment of cancer	Immunotherapy

(NEW NCERT 12th Page No. 131, 140, 141)

175. (3)

The regions outside the seminiferous tubules called interstitial spaces, contain small blood vessels and interstitial cells or Leydig cells. Leydig cells synthesise and secrete testicular hormones called androgens.

(NEW NCERT 12th Page No. 27)

176. (1)

Dense irregular connective tissue has fibroblasts and many fibres (mostly collagen) that are oriented differently. This tissue is present in the skin.

(Old NCERT 11th Page No. 103)

177. (1)

The digestive tract of birds has additional chambers, the crop and gizzard. Examples : *Corvus* (Crow), *Columba* (Pigeon), *Psittacula* (Parrot), *Struthio* (Ostrich), *Pavo* (Peacock), *Aptenodytes* (Penguin), *Neophron* (Vulture).

(NEW NCERT 11th Page No. 49, 50)

178. (3)

When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as competitive inhibitor. Due to its close structural similarity with the substrate, the inhibitor competes with the substrate for the substrate- binding site of the enzyme.

(NEW NCERT 11th Page No. 117)

179. (2)

Blood entering the right side of heart has partial pressure of oxygen, 40 mm Hg and the partial pressure of blood leaving the right side of the heart is 40 mm Hg, Both have same oxygen content.

(NEW NCERT 11th Page No. 188)

180. (3)

Antibody is a protein molecule in which the first amino acid is called N- terminal amino acid. The last amino acid is called C- terminal amino acid.

Antigen binding site is present on N-terminal of antibody.

(NEW NCERT 12th Page No. 135)

181. (3)

Basophils secrete histamine, serotonin, heparin, etc., and are involved in inflammatory reactions. Neutrophils and monocytes are phagocytic cells which destroy foreign organisms entering the body.

(NEW NCERT 11th Page No. 194)

182. (2)

Macropus and *Camelus* are mammals which are homeotherms whereas *Psittacula* is aves, which is also a homeotherm. *Chelone* belongs to class reptilia and is a poikilotherm.

(NEW NCERT 11th Page No. 49, 50, 51)

183. (4)

The parathyroid glands secrete a peptide hormone called parathyroid hormone (PTH). The secretion of PTH is regulated by the circulating levels of calcium ions and phosphate ion.

(NEW NCERT 11th Page No. 243)

184. (1)

Lactational amenorrhea (absence of menstruation) method is based on the fact that ovulation and therefore the cycle do not occur during the period of intense lactation following parturition. Chances of failure, though, of natural method are high.

(NEW NCERT 12th Page No. 44)

185. (4)

Glucagon acts mainly on the liver cells (hepatocytes) and stimulates glycogenolysis resulting in an increased blood sugar (hyperglycemia). Insulin acts mainly on hepatocytes and adipocytes (cells of adipose tissue), and enhances cellular glucose uptake and utilisation. As a result, there is a rapid movement of glucose from blood to hepatocytes and adipocytes resulting in decreased blood glucose levels (hypoglycemia).

(NEW NCERT 11th Page No. 245, 246)

SECTION-B

186. (3)

The process of formation of a mature female gamete is called oogenesis. Oogenesis is initiated during the embryonic development stage when a couple of million gamete mother cells (oogonia) are formed within each fetal ovary; no more oogonia are formed and added after birth.

(NEW NCERT 12th Page No. 32)

187. (4)

In birds and mammals, oxygenated and deoxygenated blood received by the left and right atria respectively passes on to the ventricles of the same sides. The ventricles pump it out without any mixing up, i.e., two separate circulatory pathways are present in these organisms, hence, these animals have double circulation. Double circulation means the blood circulates twice through the heart.

(**NEW NCERT 11th Page No. 197)**

188. (2)

Oxytocin acts on the smooth muscles of our body and stimulates their contraction. In females, it stimulates a vigorous contraction of uterus at the time of child birth, and milk ejection from the mammary gland. Vasopressin acts mainly at the kidney and stimulates resorption of water and electrolytes by the distal tubules and thereby reduces loss of water through urine (diuresis). Hence, it is also called as anti-diuretic hormone (ADH).

(NEW NCERT 11th Page No. 242)

189. (3)

Each antibody molecule has four peptide chains, two small called light chains and two longer called heavy chains. The cell-mediated immune response is responsible for the graft rejection. The T-cells themselves do not secrete antibodies but help B cells produce them.

(NEW NCERT 12th Page No. 135, 136)

190. (3)

The enlarged end of penis called the glans penis is covered by a loose fold of skin called foreskin or prepuse. After vasectomy, sperm immediately do not disappear in semen. Sperms are stored in epididymis.

(NEW NCERT 11th Page No. 28, 46)

191. (2)

The zygote or early embryos (with upto 8 blastomeres) could be transferred into the fallopian tube (ZIFT–zygote intra fallopian transfer) and embryos with more than 8 blastomeres, into the uterus (IUT – intra uterine transfer), to complete its further development. Embryos formed by in-vivo fertilisation (fusion of gametes within the female) could be used for such transfer to assist those females who cannot conceive. Transfer of an ovum collected from a donor into the fallopian tube (GIFT – gamete intra fallopian transfer) of another female who cannot produce one, but can provide suitable environment for fertilisation and further development is another method attempted. Intra cytoplasmic sperm injection (ICSI) is another specialised procedure to form an embryo in the laboratory in which a sperm is directly injected into the ovum.

(NEW NCERT 12th Page No. 48)

192. (1)

The male reproductive system is located in the pelvis region. The urethra originates from the urinary bladder.

Each ovary is about 2 to 4 cm in length.

The presence or absence of hymen is not a reliable indicator of virginity or sexual experience.

(NEW NCERT 12th Page No. 26, 27)

193. (1)

The thymus is quite large at the time of birth but keeps reducing in size with age and by the time puberty is attained it reduces to a very small size. It secretes thymosin which is responsible for immunity. On decrease size, thymosin secretion decreases and hence immunity decreases in old persons.

(NEW NCERT 11th Page No. 243)

194. (4)

GnRH is secreted by the hypothalamus which stimulates the anterior lobe of pituitary gland to secrete luteinising hormone (LH) and FSH. FSH stimulates the growth of the ovarian follicles and stimulates the formation of estrogens. LH stimulates the corpus luteum to secrete progesterone. Rising levels of progesterone and estrogen inhibits the release of GnRH, which in turn, inhibits the production of FSH and LH.

(NEW NCERT 12th Page No. 34, 35)

195. (3)

In humans, the gamete contributed by the male determines whether the child produced will be male or female.

Sex in human depend on Y- chromosome.

(NEW NCERT 12th Page No. 36)

196. (4)

In vasectomy, a small part of the vas deferens is removed or tied up through a small incision on the scrotum whereas in tubectomy, a small part of the fallopian tube is removed or tied up through a small incision in the abdomen or through vagina. These techniques are highly effective but their reversibility is very poor.

(**NEW NCERT 12th Page No. 46)**

197. (4)

The members of subphylum Vertebrata possess notochord during the embryonic period. The notochord is replaced by a cartilaginous or bony vertebral column in the adult. In protochordates (cephalochordates and urochordates), notochord is present but vertebral column is absent therefore, they are chordates but not vertebrates. Thus all vertebrates are chordates but all chordates are not vertebrates.

(NEW NCERT 11th Page No. 46)

198. (3)

The mouth in cockroach opens into a short tubular pharynx, leading to a narrow tubular passage called oesophagus. This in turn opens into a sac like structure called crop used for storing of food. The crop is followed by gizzard or proventriculus.

(Old NCERT 11th Page No. 113)

199. (1)

Proteins are polypeptides. They are linear chains of amino acids linked by peptide bonds. A protein is a heteropolymer and not a homopolymer. Tertiary structure is absolutely necessary for the many biological activities of proteins.

(NEW NCERT 11th Page No. 109, 112)

200. (2)

Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. It is caused due to allergens such as dust, animal dander etc.

(NEW NCERT 11th Page No. 190)

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